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Automatic communication circuit selection system for on-line system of  
computer system - has packet switching circuit and public switching  
circuit which enable data transmission between computers according to  
data forwarding quantity

Patent Assignee: NEC CORP (NIDE )  
Number of Countries: 001 Number of Patents: 001  
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Priority Applications (No Type Date): JP 97102705 A 19970404

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JP 10285215	A	4	H04L-012/56	

Abstract (Basic): JP 10285215 A:

The system uses a packet switching circuit (3) and a public circuit (4) to connect several computers (1,2). The amount of the forwarding data in the packet switching circuit and public circuit is measured during data transmission between the computers. The transmission of a fixed amount of data between the computers is continued when the public circuit is used as the transmission line, otherwise, the connection of the packet switching circuit between the computers is disconnected and reconnected to the public circuit for restarting data transmission.

The transmission of a small amount of data between the computers is continued at a constant rate when the packet switching circuit is used as the transmission line, otherwise, the connection of the public circuit between the computers is disconnected and reconnected to the packet switching circuit for restart of data transmission.

ADVANTAGE - Enables efficient utilisation of communication circuit since suitable communication circuit is selected based on data forwarding quantity, thereby communication expense can be reduced.

Dwg.1/1

Title Terms: AUTOMATIC; COMMUNICATE; CIRCUIT; SELECT; SYSTEM; ON-LINE; SYSTEM; COMPUTER; SYSTEM; PACKET; SWITCH; CIRCUIT; PUBLIC; SWITCH; CIRCUIT; ENABLE; DATA; TRANSMISSION; COMPUTER; ACCORD; DATA; FORWARDING; QUANTITY

Derwent Class: T01; W01; W02

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International Patent Class (Additional): H04L-001/22; H04L-029/06;

H04M-011/00

File Segment: EPI

2/5/2 (Item 1 from file: 347)  
DIALOG(R)File 347:JAPIO  
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06002115 \*\*Image available\*\*  
AUTOMATIC COMMUNICATION LINE SELECTION SYSTEM

PUB. NO.: 10-285215 A]  
PUBLISHED: October 23, 1998 (19981023)  
INVENTOR(s): ONO YUJI  
APPLICANT(s): NEC CORP [000423] (A Japanese Company or Corporation), JP (Japan)  
APPL. NO.: 09-102705 [JP 97102705]  
FILED: April 04, 1997 (19970404)  
INTL CLASS: [6] H04L-012/56; H04L-001/22; H04L-029/06; H04M-011/00

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JAPIO CLASS: 44.3 (COMMUNICATION -- Telegraphy); 44.4 (COMMUNICATION -- Telephone)

#### ABSTRACT

PROBLEM TO BE SOLVED: To provide an automatic communication line selection system for an on-line system consisting of computers which are interconnected by a packet exchange line and a public line where both the communication lines are used efficiently and the communication cost is decreased by selecting the packet exchange line or the public line depending on a data transfer quantity.

SOLUTION: In the case of data transfer between application programs 5, 6 in an on-line system consisting of computers 1, 2 which are interconnected by a packet exchange line 3 and a public line 4, a transfer quantity measurement section 7 measures and records a data transfer quantity within a prescribed time, a communication line changeover section 8 acquires the data transfer quantity information at breaks of data transfer blocks and selects the packet exchange line 3 when the data transfer quantity is less than a prescribed quantity in the case that the public line is connected, and selects the public line 4 when the data transfer quantity is more than a prescribed quantity in the case that the packet exchange line is connected.

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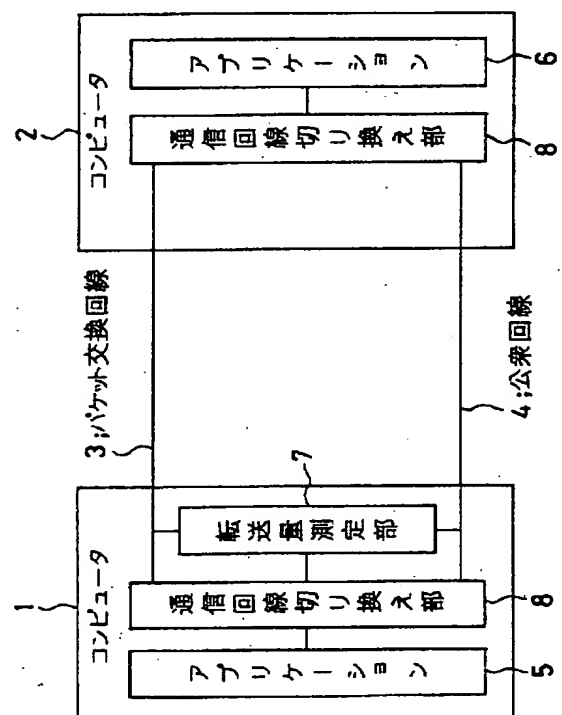
(74)代理人 弁理士 加藤 朝道

(54)【発明の名称】 自動通信回線選択システム

(57)【要約】

【課題】コンピュータ間がパケット交換回線と公衆回線とで接続されたオンラインシステムにおいて、データ転送量に応じて通信回線をパケット交換回線又は公衆回線に切り換えてデータ転送を行うことにより、通信回線を効率よく使用し、通信費用を削減する自動通信回線選択システムの提供。

【解決手段】コンピュータ1、2間がパケット交換回線3と公衆回線4で接続されたオンラインシステムにおいて、アプリケーション5が6とデータ転送する場合、転送量測定部7は一定時間内のデータ転送量を測定記録し、通信回線切り換え部8は、データ転送ブロックの切れ目にデータ転送量情報を入手し、公衆回線接続時、データ転送量が一定量より少ない場合にはパケット交換回線3に切り換え、パケット交換回線接続時、データ転送量が一定量より多い場合には公衆回線4に切り換えデータ転送する。



## 【特許請求の範囲】

【請求項1】 情報処理装置間がパケット交換回線と公衆回線の2回線で接続され、前記情報処理装置間でのデータ転送時に回線のデータ転送量を測定し、データ転送量がある一定量以上の場合、現在使用している回線が、公衆回線であれば継続してデータ転送を行い、パケット交換回線であれば現在使用しているパケット交換回線を切断し公衆回線に再接続してデータ転送を再開し、一方、データ転送量がある一定量よりも小の場合、現在使用している回線が、パケット交換回線であれば継続してデータ転送を行い、公衆回線であれば現在使用している公衆回線を切断しパケット交換回線に再接続してデータ転送を再開する、ことを特徴とする自動通信回線選択システム。

【請求項2】 情報処理装置間がパケット交換回線と公衆回線の2回線で接続されたオンラインシステムにおいて、

前記情報処理装置がデータ転送する場合、一定時間内のデータ転送量を測定する転送量測定手段と、

データ転送の切れ間に前記転送量測定手段よりデータ転送量情報を入手し、公衆回線接続時において、データ転送量がある一定量よりも少ない場合にはパケット交換回線接続に切り換えてデータ転送を行い、パケット交換回線接続時において、データ転送量がある一定量よりも多い場合には、公衆回線接続に切り換えてデータ転送を行う通信回線切り換え手段と、

を備えたことを特徴とする自動通信回線選択システム。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】 本発明は、コンピュータ装置及び通信端末等の情報処理装置間がパケット交換回線と公衆回線の2回線で接続されたオンラインシステムに関し、特に、データ転送量によって接続回線を自動的に切り換える自動通信回線選択システムに関する。

## 【0002】

【従来の技術】 コンピュータ間が通信回線で接続された、従来のオンラインシステムでは、使用する通信回線は、データ転送量に関係なく、パケット交換回線または公衆回線などに固定されるか、またはデータ転送開始前に予め任意の回線を選択して使用する必要があり、データ転送量の変動に応じて使用回線を変更することはできず、効率よく通信回線が使用されていない、というのが実状である。

【0003】 なお、例えば特開平1-208051号公報には、パケット交換網において、データ端末が指定する通信速度の通信回線がデータ転送用として選択され、データ端末の要求に合致した通信速度でデータ転送が実行可能とした回線選択方式が提案されている。また特開平5-22367号公報には、通信回線の通信速度を決定する際に、過去に実施された通信のデータ転送量と

様の通信が実施されるものとし、データ転送量に最適な通信速度を決定するようにした通信制御装置が提案されている。

## 【0004】

【発明が解決しようとする課題】 上記した従来技術においては、通信回線を選択する場合、データ転送前に、アプリケーションまたはオペレータが通信回線を事前に選択することが必要とされており、データ転送量の変動に応じて通信回線を変更することができない、という問題点を有している。

【0005】 その理由は、上記従来の技術においては、データ転送中にデータ転送量に応じて使用する通信回線を自動選択する手段を具備していない、ことによる。

【0006】 したがって、本発明は、上記問題点に鑑みてなされたものであって、その目的は、コンピュータ間がパケット交換回線と公衆回線とで接続されたオンラインシステムにおいて、データ転送量に応じて通信回線をパケット交換回線又は公衆回線に切り換えてデータ転送を行うことにより、通信回線を効率よく使用し、通信費用を削減する自動通信回線選択システムを提供することにある。

## 【0007】

【課題を解決するための手段】 前記目的を達成するため、本発明の自動通信回線選択システムは、情報処理装置間がパケット交換回線と公衆回線の2回線で接続され、前記情報処理装置間でのデータ転送時に回線のデータ転送量を測定し、データ転送量がある一定量以上の場合、現在使用している回線が、公衆回線であれば継続してデータ転送を行い、パケット交換回線であれば現在使用しているパケット交換回線を切断し公衆回線に再接続してデータ転送を再開し、一方、データ転送量がある一定量よりも小の場合、現在使用している回線が、パケット交換回線であれば継続してデータ転送を行い、公衆回線であれば現在使用している公衆回線を切断しパケット交換回線に再接続してデータ転送を再開する、ことを特徴とする。

【0008】 本発明は、好ましくは、情報処理装置間がパケット交換回線と公衆回線の2回線で接続されたオンラインシステムにおいて、情報処理装置がデータ転送する場合、一定時間内のデータ転送量を測定する転送量測定手段と、データ転送の切れ間に、前記転送量測定手段よりデータ転送量情報を入手し、公衆回線接続時において、データ転送量がある一定量よりも少ない場合にはパケット交換回線接続に切り換えてデータ転送を行い、パケット交換回線接続時において、データ転送量がある一定量よりも多い場合には、公衆回線接続に切り換えてデータ転送を行う通信回線切り換え手段と、を備えたことを特徴とする。

## 【0009】

【発明の実施の形態】 本発明の実施の形態について以下

に説明する。本発明の自動通信回線選択システムは、その好ましい実施の形態において、データ処理装置及び通信端末等の情報処理装置間がパケット交換回線と公衆回線の2回線で接続されたオンラインシステムにおいて、情報処理装置上のアプリケーションがデータ転送する場合、一定時間内のデータ転送量を測定する転送量測定手段(図1の7)と、データ転送のブロックの切れ目にて、転送量測定手段よりデータ転送量情報を入手し、現在、公衆回線に接続されている場合であって、測定したデータ転送量がある一定量より少ない場合にはパケット交換回線接続に切り換え、またパケット交換回線に接続されている場合であって、測定したデータ転送量がある一定量より多い場合は、公衆回線接続に切り換え、継続してデータ転送を行う通信回線切り換え手段(図1の8)と、を備えている。

【0010】このように、本発明の実施の形態においては、転送量測定手段が測定したデータ転送量情報を基に、通信回線切り換え手段が自動的にデータ転送量に応じた通信回線に切り換え、データ転送を行うことで、効率よく通信回線を使用し、通信費を削減することができる。

【0011】

【実施例】上記した本発明の実施の形態について更に詳細に説明すべく、本発明の実施例について図面を参照して以下に説明する。

【0012】図1は、本発明の一実施例の構成を示すブロック図である。図1を参照すると、本実施例においては、コンピュータ1とコンピュータ2とが、パケット交換回線3と公衆回線4の2回線で接続され、オンラインシステムを構成している。コンピュータ1のアプリケーション5がコンピュータ2のアプリケーション6とデータ転送する場合、転送量測定部7は、一定時間内のデータ転送量を測定し、通信回線切り換え部8は、データ転送ブロックの切れ目に、転送量測定部7よりデータ転送量情報を入手し、公衆回線接続時、データ転送量がある一定量より少ない場合はパケット交換回線3接続に切り換えてデータ転送を行い、またパケット交換回線3接続時、データ転送量がある一定量より多い場合は、公衆回線4接続に切り換えてデータ転送を行う。

【0013】次に、本発明の実施例の動作について説明する。

【0014】コンピュータ1のアプリケーション5がコンピュータ2のアプリケーション6とデータ転送する場合、初期接続は、予め設定された通信回線にて接続してデータ転送を行う。

【0015】データ転送が開始されると、転送量測定部7は、データ転送量を監視し、一定時間内に転送される

データ量を記録する。転送量測定部7は、一定間隔で測定したデータ量を記録していく。

【0016】通信回線切り換え部8は、データ転送の転送ブロックの切れ目にて、転送開始または回線切り換え後、一定時間が経過している時、転送量測定部7より、記録されている最新のデータ転送量情報を入手する。

【0017】そして、入手したデータ転送量が予め定めた一定量(基準値)よりも多い場合、現在使用している通信回線が、公衆回線4であれば継続してデータ転送を行う。一方、現在使用している通信回線がパケット交換回線3であれば、通信回線切り換え部8は、現在使用しているパケット交換回線3を切断し、公衆回線4で再接続してデータ転送を再開する。

【0018】また、転送量測定部7より入手したデータ転送量が一定量より少ない場合、現在使用している通信回線がパケット交換回線3であれば、継続してデータ転送を行う。一方、現在使用している通信回線が公衆回線4であれば、通信回線切り換え部8は、現在使用している公衆回線を切断し、パケット交換回線3で再接続してデータ転送を再開する。

【0019】現在使用している通信回線を切断した時、アプリケーションよりデータ転送要求を受けつけた場合は、通信回線切り換え部8は、そのデータを保留し、再接続完了後、データ転送を再開する。

【0020】上記の通り、本実施例によれば、アプリケーションおよびそれを使用しているオペレータは、使用する通信回線を意識することなく、自動的にデータ転送量に適した通信回線を使用することができ、通信費を削減することができる。

【0021】

【発明の効果】以上説明したように、本発明によれば、データ転送量を随時監視し、データ転送量に応じた通信回線に自動的に切り換えるように構成したことにより、データ転送量に応じて適した通信回線を選択することが可能となり、通信回線を効率よく利用することができ、通信費を削減することができる、という効果を奏する。

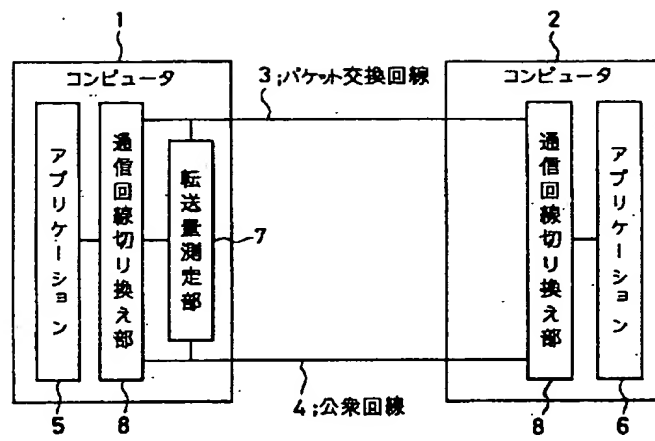
【図面の簡単な説明】

【図1】本発明の一実施例の構成を示すブロック図である。

【符号の説明】

- 1、2 コンピュータ
- 3 パケット交換回線
- 4 公衆回線
- 5、6 アプリケーション
- 7 転送量測定部
- 8 通信回線切り換え部

【図1】



First Hit**End of Result Set**

L3: Entry 2 of 2

File: DWPI

Oct 23, 1998

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TITLE: Automatic communication circuit selection system for on-line system of computer system - has packet switching circuit and public switching circuit which enable data transmission between computers according to data forwarding quantity

PATENT-ASSIGNEE: NEC CORP (NIDE)

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## PATENT-FAMILY:

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ABSTRACTED-PUB-NO: JP 10285215A

## BASIC-ABSTRACT:

The system uses a packet switching circuit (3) and a public circuit (4) to connect several computers (1,2). The amount of the forwarding data in the packet switching circuit and public circuit is measured during data transmission between the computers. The transmission of a fixed amount of data between the computers is continued when the public circuit is used as the transmission line, otherwise, the connection of the packet switching circuit between the computers is disconnected and reconnected to the public circuit for restarting data transmission.

The transmission of a small amount of data between the computers is continued at a constant rate when the packet switching circuit is used as the transmission line, otherwise, the connection of the public circuit between the computers is disconnected and reconnected to the packet switching circuit for restart of data transmission.

ADVANTAGE - Enables efficient utilisation of communication circuit since suitable communication circuit is selected based on data forwarding quantity, thereby communication expense can be reduced.

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## EQUIVALENT-ABSTRACTS:

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(71)Applicant : NEC CORP

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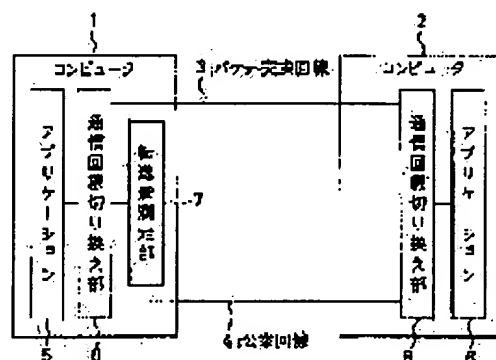
(72)Inventor : ONO YUJI

## (54) AUTOMATIC COMMUNICATION LINE SELECTION SYSTEM

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide an automatic communication line selection system for an on-line system consisting of computers which are interconnected by a packet exchange line and a public line where both the communication lines are used efficiently and the communication cost is decreased by selecting the packet exchange line or the public line depending on a data transfer quantity.

**SOLUTION:** In the case of data transfer between application programs 5, 6 in an on-line system consisting of computers 1, 2 which are interconnected by a packet exchange line 3 and a public line 4, a transfer quantity measurement section 7 measures and records a data transfer quantity within a prescribed time, a communication line changeover section 8 acquires the data transfer quantity information at breaks of data transfer blocks and selects the packet exchange line 3 when the data transfer quantity is less than a prescribed quantity in the case that the public line is connected, and selects the public line 4 when the data transfer quantity is more than a prescribed quantity in the case that the packet exchange line is connected.



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CLAIMS

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[Claim(s)]

[Claim 1] Between information processors is connected by two circuits of the packet switched line and a public line. The amount of data transfer of a circuit is measured at the time of the data transfer between said information processors. When it is more than a constant rate with the amount of data transfer, if the circuit used now is a public line, it will continue and will perform data transfer. Cut the packet switched line which is carrying out current use if it is the packet switched line, re-connect with a public line, and data transfer is resumed. On the other hand, in the case of smallness, the circuit which is carrying out current use rather than a constant rate with the amount of data transfer The automatic communication line selected system characterized by what data transfer will be continuously performed if it is the packet switched line, the public line which is carrying out current use if it is a public line is cut, it re-connects with the packet switched line, and data transfer is resumed for.

[Claim 2] In the on-line system to which between information processors was connected by two circuits of the packet switched line and a public line When said information processor carries out data transfer, the amount information of data transfer comes to hand from said amount measurement means of transfers to an amount measurement means of transfers to measure the amount of data transfer within fixed time amount, and the interval of data transfer, and it sets at the time of dial-up connection. In being fewer than a constant rate with the amount of data transfer, switch to packet switched-line connection and perform data transfer, and it sets at the time of packet switched-line connection. The automatic communication line selected system characterized by having a communication line switch means to switch to dial-up connection and to perform data transfer when [ than a constant rate with the amount of data transfer ] more.

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[Translation done.]

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the automatic communication line selected system which switches a connection circuit automatically with the amount of data transfer especially about the on-line system to which between information processors, such as a computer apparatus and a communication terminal, was connected by two circuits of the packet switched line and a public line.

[0002]

[Description of the Prior Art] The actual condition is that it can be fixed to the packet switched line or a public line, or the communication line to which between computers was connected by the communication line and which is used in the conventional on-line system needs to choose and use the circuit of arbitration beforehand before data transfer initiation regardless of the amount of data transfer, cannot change a use circuit according to fluctuation of the amount of data transfer, and the communication line is not used efficiently.

[0003] In addition, in the packet exchange network, the communication line of the transmission speed specified by a data terminal is chosen as JP,1-208051,A as an object for data transfer, and the circuit selection method which enabled activation of data transfer with the transmission speed corresponding to the demand of a data terminal is proposed, for example. Moreover, in case the transmission speed of a communication line is determined, the communication controller which the same communication link as the amount of data transfer of the communication link carried out in the past shall be carried out, and determined the optimal transmission speed for the amount of data transfer is proposed by JP,5-22367,A.

[0004]

[Problem(s) to be Solved by the Invention] In the above-mentioned conventional technique, when choosing a communication line, it is needed before data transfer for application or an operator to choose a communication line in advance, and it has the trouble that a communication line cannot be changed according to fluctuation of the amount of data transfer.

[0005] The reason is based on what the means which makes automatic selection of the communication line used according to the amount of data transfer during data transfer is not provided for in the above-mentioned Prior art.

[0006] Therefore, this invention is made in view of the above-mentioned trouble, and in the on-line system to which between computers was connected with the packet switched line and a public line, by switching a communication line to the packet switched line or a public line according to the amount of data transfer, and performing data transfer, the purpose uses a communication line efficiently and is to offer the automatic communication line selected system which reduces communication link costs.

[0007]

[Means for Solving the Problem] In order to attain said purpose, the automatic communication line selected system of this invention Between information processors is connected by two circuits of the packet switched line and a public line. The amount of data transfer of a circuit is measured at the time of the data transfer between said information processors. When it is more than a constant rate with the

amount of data transfer, if the circuit used now is a public line, it will continue and will perform data transfer. Cut the packet switched line which is carrying out current use if it is the packet switched line, re-connect with a public line, and data transfer is resumed. Rather than the constant rate which, on the other hand, has the amount of data transfer, if the circuit which is carrying out current use in the case of smallness is the packet switched line, data transfer will be performed continuously, and if it is a public line, it will be characterized by what the public line which is carrying out current use is cut, it re-connects with the packet switched line, and data transfer is resumed for.

[0008] In the on-line system to which this invention is desirable and between information processors was connected by two circuits of the packet switched line and a public line When an information processor carries out data transfer, from said amount measurement means of transfers, the amount information of data transfer comes to hand to an amount measurement means of transfers to measure the amount of data transfer within fixed time amount, and the interval of data transfer, and it sets to them at the time of dial-up connection. In being fewer than a constant rate with the amount of data transfer, switch to packet switched-line connection and perform data transfer, and it sets at the time of packet switched-line connection. When [ than a constant rate with the amount of data transfer ] more, it is characterized by having a communication line switch means to switch to dial-up connection and to perform data transfer.

[0009]

[Embodiment of the Invention] The gestalt of operation of this invention is explained below. The automatic communication line selected system of this invention is set in the gestalt of the desirable operation. In the on-line system to which between information processors, such as a data processor and a communication terminal, was connected by two circuits of the packet switched line and a public line An amount measurement means of transfers to measure the amount of data transfer within fixed time amount when the application on an information processor carries out data transfer (7 of drawing 1 ), In the break of a block of data transfer, the amount information of data transfer comes to hand from the amount measurement means of transfers. Are the case where it connects with current and a public line, and in being fewer than a constant rate with the measured amount of data transfer, it switches to packet switched-line connection. Moreover, it is the case where it connects with the packet switched line, and when [ than a constant rate with the measured amount of data transfer ] more, it has a communication line switch means (8 of drawing 1 ) to switch to dial-up connection and perform data transfer continuously.

[0010] Thus, in the gestalt of operation of this invention, based on the amount information of data transfer which the amount measurement means of transfers measured, it switches to the communication line according to the amount of data transfer automatically, and a communication line switch means can use a communication line efficiently, and can reduce traffic by performing data transfer.

[0011]

[Example] The gestalt of operation of above-mentioned this invention is explained below with reference to a drawing about the example of this invention that it should explain to a detail further.

[0012] Drawing 1 is the block diagram showing the configuration of one example of this invention. If drawing 1 is referred to, in this example, it connects by two circuits of the packet switched line 3 and a public line 4, and the computer 1 and the computer 2 constitute on-line system. When the application 5 of a computer 1 carries out data transfer to the application 6 of a computer 2, the amount test section 7 of transfers The amount of data transfer within fixed time amount is measured. The communication line switch section 8 To the break of a data transfer block, the amount information of data transfer comes to hand from the amount test section 7 of transfers. When fewer at the time of dial-up connection than a constant rate with the amount of data transfer, it switches to packet switched-line 3 connection, and data transfer is performed, and when [ than a constant rate with the amount of data transfer ] more [ at the time of packet switched-line 3 connection ], it switches to public line 4 connection, and data transfer is performed.

[0013] Next, actuation of the example of this invention is explained.

[0014] When the application 5 of a computer 1 carries out data transfer to the application 6 of a

computer 2, it connects in the communication line set up beforehand, and a handshake performs data transfer.

[0015] If data transfer is started, the amount test section 7 of transfers will supervise the amount of data transfer, and will record the amount of data transmitted in fixed time amount. The amount test section 7 of transfers records the amount of data measured at fixed spacing.

[0016] In the break of a transfer block of data transfer, after transfer initiation or a circuit switch, the communication line switch section 8 receives the newest amount information of data transfer currently recorded from the amount test section 7 of transfers, when fixed time amount has passed.

[0017] And when there are more amounts of data transfer which came to hand than the constant rate (reference value) defined beforehand, if the communication line which is carrying out current use is a public line 4, it will continue and will perform data transfer. On the other hand, if the communication line which is carrying out current use is the packet switched line 3, the packet switched line 3 which is carrying out current use will be cut, it will re-connect with a public line 4, and the communication line switch section 8 will resume data transfer.

[0018] Moreover, if the communication line which is carrying out current use is the packet switched line 3 when there are few amounts of data transfer which came to hand from the amount test section 7 of transfers than a constant rate, data transfer will be performed continuously. On the other hand, if the communication line which is carrying out current use is a public line 4, the public line which is carrying out current use will be cut, it will re-connect by the packet switched line 3, and the communication line switch section 8 will resume data transfer.

[0019] When the communication line which is carrying out current use is cut and a data transfer demand is received from application, the communication line switch section 8 suspends the data, and resumes data transfer after the completion of re-connection.

[0020] According to this example the above-mentioned passage, without being conscious of the communication line to be used, the operator who is using application and it can use the communication line which was automatically suitable for the amount of data transfer, and can reduce traffic.

[0021]

[Effect of the Invention] By according to this invention, having supervised the amount of data transfer at any time, and having constituted so that it might switch to the communication line according to the amount of data transfer automatically as explained above, it becomes possible to choose the communication line which was suitable according to the amount of data transfer, a communication line can be used efficiently, and the effectiveness that traffic is reducible is done so.

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[Translation done.]

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the configuration of one example of this invention.

[Description of Notations]

- 1 Two Computer
- 3 Packet Switched Line
- 4 Public Line
- 5 Six Application
- 7 The Amount Test Section of Transfers
- 8 Communication Line Switch Section

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[Translation done.]

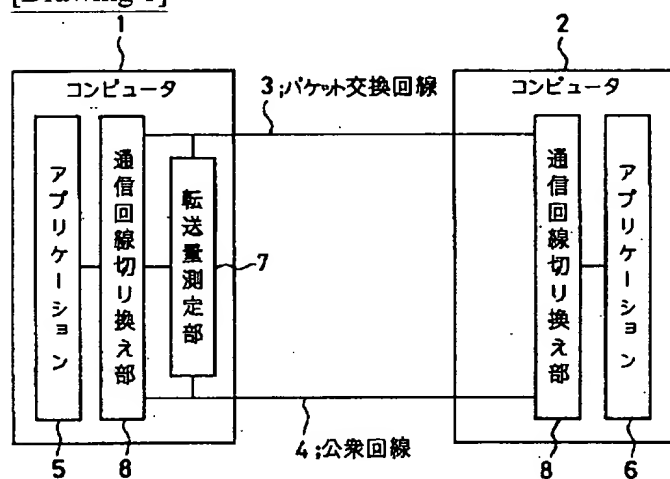
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## DRAWINGS

[Drawing 1]



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